

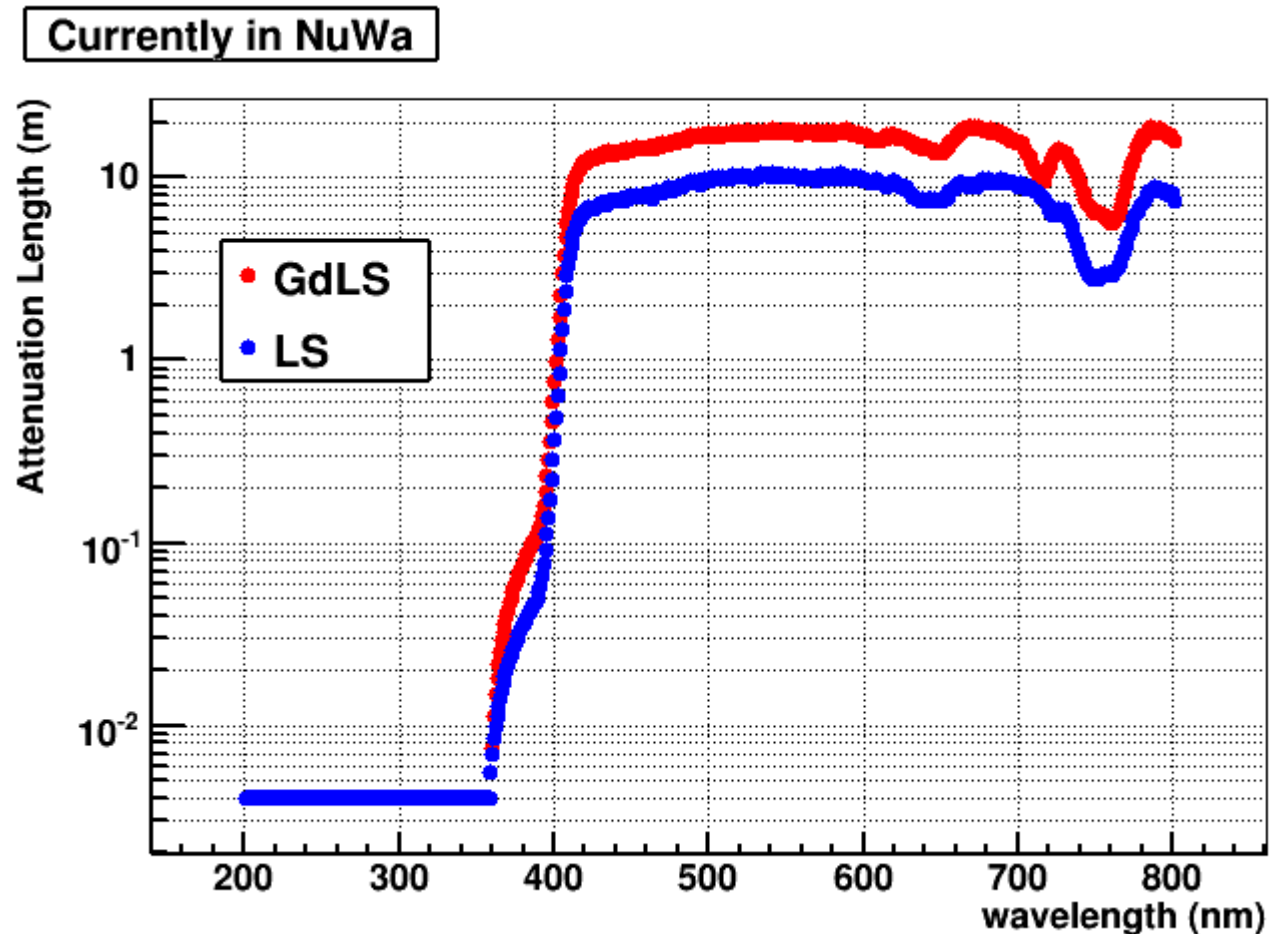
Absorption/Emission Spectra and PE Yield

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BNL Daya Bay Meeting
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Attenuation Length

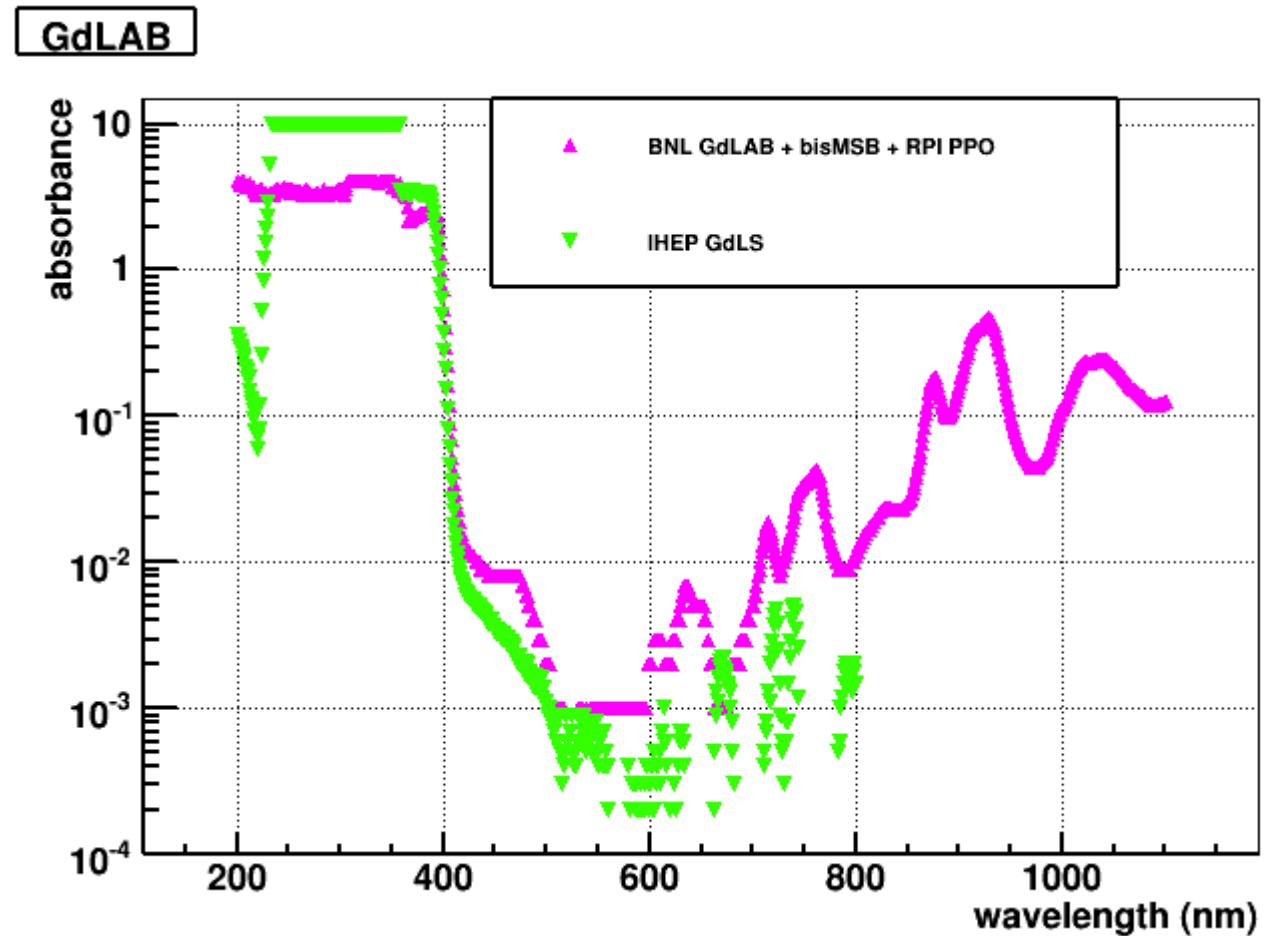
10 cm cell
measurements
made at IHEP were
normalized to the 1
m tube
measurements at
440 nm, 13.7 m for
Gd-LAB and 7.5 m
for LS (not LAB).

Normalization only
done for >400 nm,
10 cm
measurement value
was used for 200-
360 nm, with a
linear transition to
400 nm.



Absorption spectrum

raw 10 cm cell
measurements (no
corrections or
normalization)
from IHEP and BNL



Questions

how do we handle the <400 nm region? (a measurement at <400 nm with Johnny's system would be helpful.)
does it matter? i.e., how much of an effect does it have on the pe yield?

what about the edge region ~ 380 - 410 nm? how do small deviations here affect the pe yield?

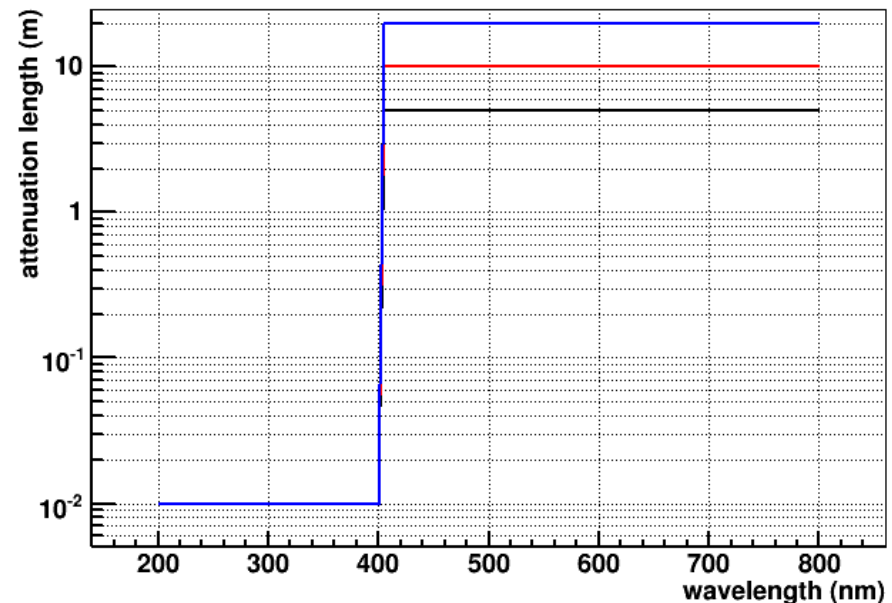
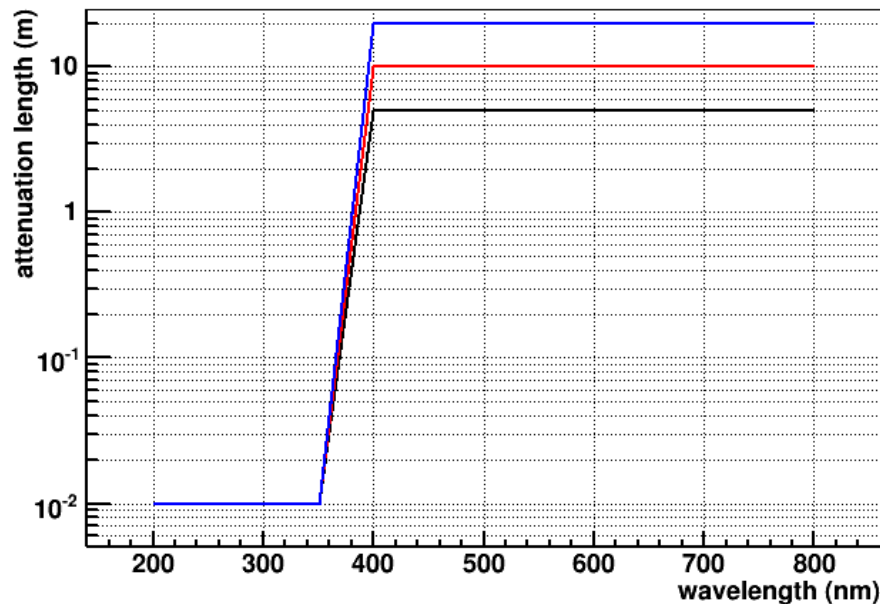
what is our pe yield requirement? (>100 pe/MeV?) given that, what does the attenuation length at ~ 430 nm need to be? is 5 m good enough?

Simulation Plan

do simulations using simple shape for the spectrum, adjusting the 200-350 nm region, the edge region, and >400 nm region.

looking at pe yield for IBD positrons and pe yield uniformity for IBD neutron capture on Gd

using the same spectrum for LS and Gd-LS

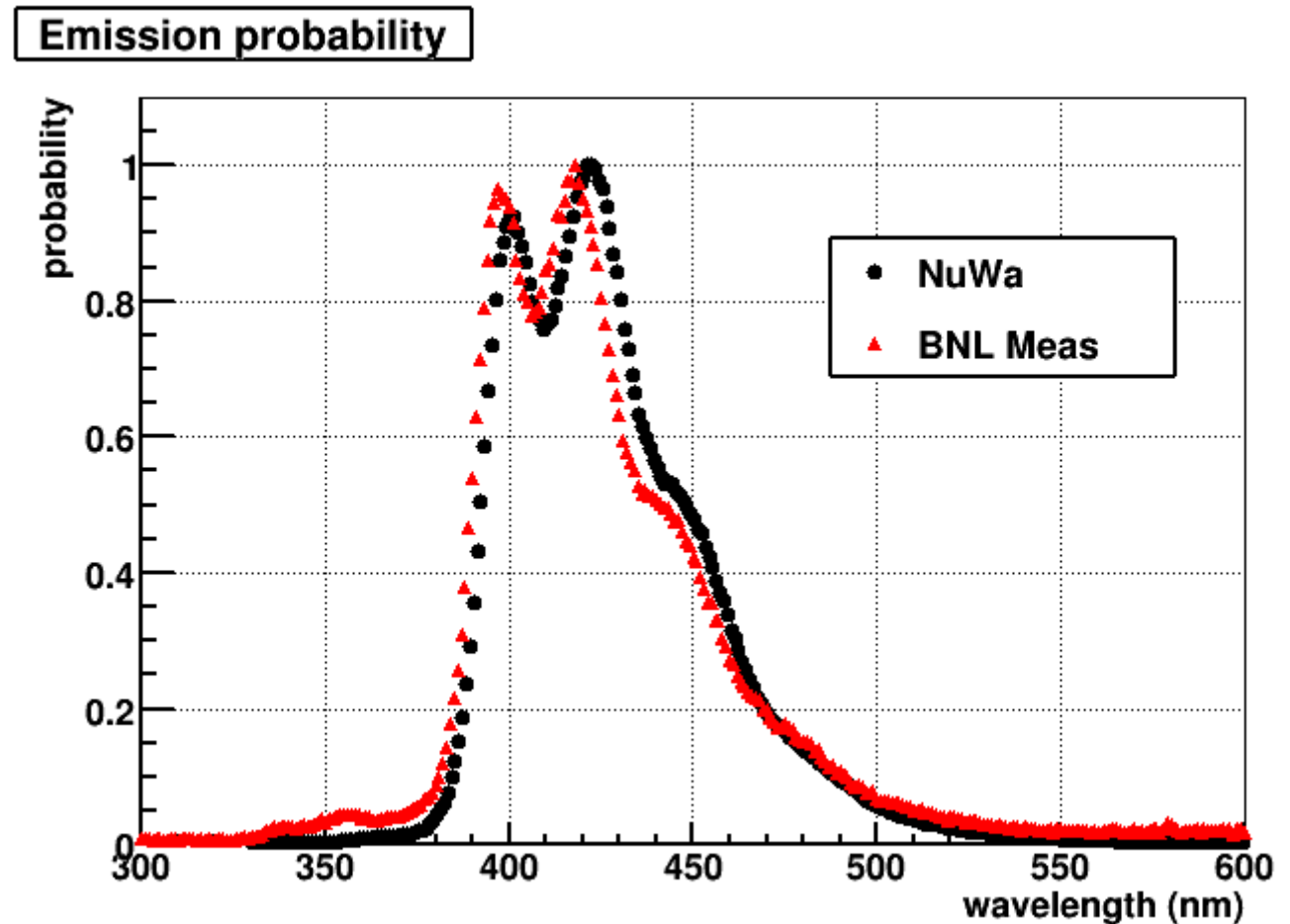


Emission Spectrum

The red curve is the emission spectrum from Minfang normalized such that the peak is 1.

The black curve is based on IHEP measurements.

what is the effect of this small shift in this spectrum on the pe yield?



Status

Files for spectrums shown on page 5 are almost ready.

Not sure how far I will get before the meeting, as coop is tied up with muon jobs for a few days.

Supposing I could have enough for a talk, is this a LS workshop talk or a simulation workshop talk?